

Complex cellular structures

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I will talk about a joint work with Novikov on “complex cells”, which are a complexification of the cells/cylinders used in o-minimality theory. It turns out that complex cells admit a canonical hyperbolic metric which is not directly accessible in the real setting, leading to a much richer structure theory. In particular, complex cells are closer than real cells to resolution of singularities - and many of their basic properties are inspired by this connection.

Our main motivation for introducing complex cells was to prove a sharper form of the Yomdin-Gromov lemma, leading to some applications in dynamics and number theory. I will outline how complex cells can be used to achieve this, and in particular how their hyperbolic structure leads to much sharper constructions compared to the previously existing methods.